

try in the tunneling and thus diode-like behaviour. On the other hand, a graphene/insulator/graphene structure will be symmetric (unless one graphene layer is treated as such to offset its work function) and tunneling of electrons will be perfectly bidirectional upon reversing the bias.

[0095] FIG. 11 illustrates schematically a computer/processor readable medium **1141** providing a computer program according to one embodiment. In this example, the computer/processor readable medium **1141** is a disc such as a digital versatile disc (DVD) or a compact disc (CD). In other embodiments, the computer/processor readable medium **1141** may be any medium that has been programmed in such a way as to carry out an inventive function. The computer/processor readable medium **1141** may be a removable memory device such as a memory stick or memory card (SD, mini SD or micro SD).

[0096] The computer program may comprise computer code configured to perform, control or enable the following: forming an apparatus from a first layer of electrically conductive material, a second layer of electrically conductive material and a layer of electrically insulating material to provide an apparatus comprising the first and second layers of electrically conductive material separated by the layer of electrically insulating material, wherein one or both layers of electrically conductive material comprise graphene, and wherein the apparatus is configured such that electrons are able to tunnel from the first layer of electrically conductive material through the layer of electrically insulating material to the second layer of electrically conductive material.

[0097] Additionally or alternatively, the computer program may comprise computer code configured to perform, control or enable one or more of the following: depositing the first layer of electrically conductive material on top of a supporting substrate; depositing the layer of electrically insulating material on top of the first layer of electrically conductive material; and depositing the second layer of electrically conductive material on top of the layer of electrically insulating material.

[0098] Additionally or alternatively, the computer program may comprise computer code configured to perform, control or enable one or more of the following: depositing the first layer of electrically conductive material on top of a first supporting substrate; depositing the layer of electrically insulating material on top of the first layer of electrically conductive material; depositing the second layer of electrically conductive material on top of a second supporting substrate; placing the first supporting substrate on top of the second supporting substrate such that the first layer of electrically conductive material is separated from the second layer of electrically conductive material by the layer of electrically insulating material; and removing the first supporting substrate.

[0099] Additionally or alternatively, the computer program may comprise computer code configured to perform, control or enable one or more of the following: depositing the first layer of electrically conductive material on top of a first supporting substrate; depositing the layer of electrically insulating material on top of the first layer of electrically conductive material; depositing the second layer of electrically conductive material on top of a second supporting substrate; placing the second supporting substrate on top of the first supporting substrate such that the first layer of electrically conductive material is separated from the second layer of

electrically conductive material by the layer of electrically insulating material; and removing the second supporting substrate.

[0100] Additionally or alternatively, the computer program may comprise computer code configured to perform the following: controlling a flow of electrical current to be in a first direction in an apparatus, the apparatus comprising first and second layers of electrically conductive material separated by a layer of electrically insulating material, wherein one or both layers of electrically conductive material comprise graphene, and wherein the apparatus is configured such that electrons are able to tunnel from the first layer of electrically conductive material through the layer of electrically insulating material to the second layer of electrically conductive material, the flow of electrical current controlled by providing a difference in voltage to the first and second layers of electrically conductive material, and/or providing a difference in work function between the first and second layers of electrically conductive material.

[0101] Other embodiments depicted in the figures have been provided with reference numerals that correspond to similar features of earlier described embodiments. For example, feature number **1** can also correspond to numbers **101**, **201**, **301** etc. These numbered features may appear in the figures but may not have been directly referred to within the description of these particular embodiments. These have still been provided in the figures to aid understanding of the further embodiments, particularly in relation to the features of similar earlier described embodiments.

[0102] It will be appreciated to the skilled reader that any mentioned apparatus/device/server and/or other features of particular mentioned apparatus/device/server may be provided by apparatus arranged such that they become configured to carry out the desired operations only when enabled, e.g. switched on, or the like. In such cases, they may not necessarily have the appropriate software loaded into the active memory in the non-enabled (e.g. switched off state) and only load the appropriate software in the enabled (e.g. on state). The apparatus may comprise hardware circuitry and/or firmware. The apparatus may comprise software loaded onto memory. Such software/computer programs may be recorded on the same memory/processor/functional units and/or on one or more memories/processors/functional units.

[0103] In some embodiments, a particular mentioned apparatus/device/server may be pre-programmed with the appropriate software to carry out desired operations, and wherein the appropriate software can be enabled for use by a user downloading a "key", for example, to unlock/enable the software and its associated functionality. Advantages associated with such embodiments can include a reduced requirement to download data when further functionality is required for a device, and this can be useful in examples where a device is perceived to have sufficient capacity to store such pre-programmed software for functionality that may not be enabled by a user.

[0104] It will be appreciated that any mentioned apparatus/circuitry/elements/processor may have other functions in addition to the mentioned functions, and that these functions may be performed by the same apparatus/circuitry/elements/processor. One or more disclosed aspects may encompass the electronic distribution of associated computer programs and computer programs (which may be source/transport encoded) recorded on an appropriate carrier (e.g. memory, signal).